



Engineering Physics Lab Report 6

Experiment 6: Conservation of Mechanical Energy

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Objective

To verify law of conservation energy

Learning outcome

Upon the completion of the experiment student will be able to verify the law of conservation of energy.

Apparatus

Inclined Plane, glider, weights, stop watch

Theory

Conversation of energy is one of the most powerful laws of physics. In this experiment you will study the transformation of energy that occur when glider travels form a Inclined plane.

$$\Delta E_k = \Delta mgh$$

In another word change in potential energy is equal to change in kinetic energy.

Procedure

- 1) Keep the inclined plane horizontal
- 2) Put the glider on the plane and connect it with a string to a weight hanging from the pulley.
- 3) The weight must be of a value that when a light tap is given the glider moves in a constant speed. Take down this weight as F.
- 4) Take down the weight of the glider as R
- 5) Now adjusted the device so that the plane is inclined
- 6) Measure the starting point and the ending point of the plane where the glider will be moving from the table top and write if down as h_1 and h_2
- 7) Put the glider on the starting point and start the stop watch when it reaches the stopping point, stop the watch and take the time sown as T. Repeat this three times for better accuracy.
- 8) Measures the distances traveled and write it down as D.

Calculation

1) Friction between Plane and glider

R	F	μ
3.1 N	0.7 N	0.23
3.6 N	0.8 N	0.12
4.1 N	0.9 N	0.22

To find the co-efficient of friction, $\mu = \frac{F}{R}$

2) Potential Energy

Initial Height (h_1)	Final Height (h_2)	Initial Potential Energy P_{E1}	Final Potential Energy
35.5 cm	20	1.2	0.6
34.5 cm	19	1.23	0.7
33.5 cm	18	1.35	0.72

3) Kinetic Energy

Distance	T_1	T_2	T_3	Velocity	K_E
58	0.8	0.87	0.81	69.9 cm/s	0.0759

Discussion

I liked doing this experiment because I am going to use it in my life.

By doing this experiment I understand that energy in any form equals energy in another form. Moreover, $E = mc^2$ so energy is around us and among us if we know how to get this kind of energy out of our body and control it we will improve very fast in our life.

Conclusion

This experiment is the last experiment in Physics 1 and I understand each law of physics completely when I applied the theory of these laws.

The change in potential energy = kinetic energy + work done to overcome friction

$$P_E = K_E + (\mu R \cos \theta \times \text{Distance})$$

Work equals to force times distance.